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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,936	08/27/2001	Stephen Peter Najda	YAMAP0766US	2922

7590 11/21/2003

EXAMINER
FLORES RUIZ, DELMA R

ART UNIT	PAPER NUMBER
2828	

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DATE MAILED: 11/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/857,936	NAJDA, STEPHEN PETER	
	Examiner	Art Unit	
	Delma R. Flores Ruiz	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

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TECHNOLOGY CENTER 2800

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims1, 3 – 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Duggan Geoffrey (GB 2320609).

Regarding claim 1 Duggan discloses a optical semiconductor device comprising; an active region (see Fig. 6 Character 10); a p-doped cladding region (see Fig. 6, Character 16) disposed on one side of the active region; wherein an electron-reflecting barrier (see Fig. 6, Character 6) is provided between the cladding region and the active region for reflecting both Γ-electrons and X-electrons (see Fig. 6 – 9, 14 and 15), and the electron-reflecting barrier providing a greater potential barrier to Γ-electrons than the p-doped cladding region wherein the electron reflecting barrier comprises a first electron-reflecting layer for reflecting Γ-electrons and second electron reflecting layer for reflecting X –electrons (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claims 3 and 4, Duggan discloses a electron-reflecting layers s a strained layer and electron reflecting layers is in a state of compressive strain and the other of the electron reflecting layers is in a state of tensile strain (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claim 5 and 6, Duggan discloses a device is a light emitting diode and the device is a laser device (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claim 7, Duggan discloses a device is separate confinement heterostructure laser device comprising an optical guiding region (see Fig. 6 Character 12 and the active region (see Fig. 6, Character 10) being disposed within the optical guiding region (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claim 8, Duggan dislcoses a layer for reflecting Γ-electrons is disposed between the optical guiding region and the layer for reflecting x-electrons (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claim 9, Duggan dislcoses a Γ-conduction band of the optical guiding region is substantially degenerate with the x-conduction band of the layer for reflecting

Γ-electrons (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claim 10, Duggan discloses a layer for reflecting Γ-electrons is disposed between the layer for reflecting X-electrons and the p-doped cladding region (see Fig. 6, Character 16 and (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claim 11, Duggan discloses the electron-reflecting barrier comprises a plurality of first electron-reflecting layers for reflecting Γ-electrons and a plurality of second-reflecting layers for reflecting X-electrons (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claims 12 – 14, Duggan discloses the electron-reflecting barrier is superlattice structure (Column 1, lines 32 – 46), the device is fabricated in the (Al, Ga, In)P system, the layer for reflecting Γ-electrons is made from material selected from the group consisting of AlP and GaP, and the layer for reflecting X-electrons is made from InP. (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claims 15 and 21, Duggan dislcoses the layer for reflecting Γ-electrons is AlP and the optical guiding region is $((Al_{0.3}Ga_{0.7})_{0.52}In_{0.48}P)$ (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claim 16, Duggan discloses the thickness of each of the electron-reflecting layers is 16Å or less (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claims 17, 18, and 22, Duggan discloses the electron-reflecting layer is p-doped and contains indium (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Regarding claims 19 and 23, Duggan discloses the electron-reflecting barrier (see Figs. 6 and 12, Character 6) is disposed between the optical guiding region (see Figs. 6 and 12, Character 12) and the p-doped cladding region (see Figs. 6 and 12 Character 16).

Regarding claims 20 and 24, Duggan discloses an optical semiconductor device comprising; an optical guiding region (see Fig. 12, Character 12) an active region (see Fig. 12, Character 10) having at least one energy well, said active region being disposed in said optical guiding region; and n-doped and p-doped cladding regions (see Fig. 12, Characters 147 and 16) disposed on opposite sides of the optical

guiding region; wherein an electron-reflecting layer Γ-electrons is provided between the p-doped cladding region and the active region and wherein the electron-reflecting layer contacts with the optical guiding region so that the Γ-conduction band of the optical guiding is substantially degenerate with the X-conduction band of the electron-reflecting layer and the electron-reflecting layer is formed of AlP; and wherein the electron-reflecting layer contact with the optical guiding region so that the Γ- conduction band of the optical guiding region is substantially degenerate with the x-condition band of the electron-reflecting layer and the device is a separate confinement heterostructure laser device (see Figs. 6 – 9, 14 and 15, Abstract, page 12, paragraph 2, pages 13 – 19).

Response to Arguments

Applicant's arguments filed 9/22/2003 have been fully considered but they are not persuasive. Applicant's arguments with respect to claims 1, 3 – 24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (703) 308-6238. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.

Delma R. Flores Ruiz
Examiner
Art Unit 2828

Paul Ip
Supervisor Patent Examiner
Art Unit 2828

DRFR/PI
November 5, 2003